International trends in health inequalities – how can we explain the differences?

Gerry McCartney
NHS Health Scotland

#PHINS2018
A systematic review of international mortality inequality trends

PHINS 2018
Background

• Health inequalities in Scotland are known to be wider than in the rest of Central and Western Europe
Education based Relative Index of Inequality (RII) for all-cause mortality, **males** 30-74 years, early to mid 2000s

Education based Relative Index of Inequality (RII) for all-cause mortality, females 30-74 years, early to mid 2000s

Background

• Health inequalities in Scotland are known to be wider than in the rest of Central and Western Europe

• Understanding which nations have experienced improvements or worsening of health inequalities can inform policymaking
Purpose of this study

1. To describe the trends in inequalities in mortality and life expectancy amongst adults in high and upper-middle income countries across a range of measures of socioeconomic position.

2. To examine how mortality inequalities relate to a range of socioeconomic and political exposures at national level.
Methods

- Systematic review
- Comprehensive search of databases and grey literature
- Inclusion criteria:
  - all-cause mortality, life expectancy or survival
  - Nations with a population of >1 million inhabitants
  - ‘high income’ or ‘upper-middle income’ in 2010 only
  - Data ranked by deprivation, education, class, occupation, income or wealth
  - Proportion of population and outcome for each group, or summary measure (RII/SII) available
• Exclusion criteria:
  • Population sample does not attempt to be representative (excludes >20% from sample frame)
  • <18 year olds only
  • Ranking of socioeconomic position is not possible
  • Data over-adjusted (e.g. for self-rated health)

• Critical appraisal
  • Modified Hamilton tool to assess and classify studies for the risk of bias

• Calculation of the Slope Index of Inequality (SII) and Relative Index of Inequality (RII)
Mortality rate for those aged under 75 years, 2015

Absolute inequalities – the gap
Slope Index of Inequality (SII)
Mortality rate for those aged under 75 years, 2015

Relative inequality (RII) = \frac{\text{Absolute inequality}}{\text{average} \times \text{worse}} = 1.33
Exposures data

- Policy and Institutions:
  - Comparative Welfare Entitlements Dataset
  - Human Freedoms Index
  - Gender Inequality Index
  - Index of Economic Freedom
  - Democracy
  - Public spending on health and social security

- Economic:
  - Gross Domestic Product (GDP) per capita
  - Income inequality
Results

• >17,000 citations screened
• 247 studies included providing over 3,106 data points
• Many different sets of analyses:
  • Males/ females/ total population
  • Relative/ absolute inequalities
  • Life expectancy/ survival/ mortality
  • Different measures of socio-economic position
  • Different age groups
  • ...none of which can be directly compared
Male mortality RII by education
Men
All ages
Educational attainment
Trends data only

Better
Worse

RII (Poisson) - log scale

< Better
Worse >

Year
Men
All ages
Educational attainment
Trends data only
Higher quality studies only
Men
All ages
Educational attainment
Trends data only
Higher quality studies only
Stable/improving trends only

RI (Poisson) - log scale
Worse →
< Better

Year
Female mortality RII by education
Women
All ages
Educational attainment
Trends data only

Better
Worse

RIL (Poisson) - log scale

< Better

Year
Women
All ages
Educational attainment
Trends data only
Higher quality studies only

Better
Worse

RRI (Poisson) - log scale

Year
Women
All ages
Educational attainment
Trends data only
Higher quality studies only
Selected examples of worsening trends

- Estonia 35-64y
- Hungary 35-64y
- New Zealand 45-74y
Socioeconomic and political exposures and health inequality trends

- Multilevel modelling will be undertaken...
- ...but, the data are very (very) messy
  - Different trends by age group
  - Different trends by socioeconomic position classification used
  - Lots of missing data for exposures too
- Therefore, these case studies are illustrative only
  - Estonia as an example of Eastern Europe
  - Finland and France: long, high quality data series with periods of improvement
Income inequality

Source: SWIID6, using Luxembourg Inequality Study as index
Source: Polity 2 Index
Summary

- Health inequalities are greatest for young adults and men
- Large increases in many nations health inequalities during 1980s/1990s
- But many nations have seen declines for at least some periods – even in relative terms (contrary to some claims)
- Divergent trends are seen for different measures of socioeconomic position, age groups and for absolute/relative inequalities
- The quality of the data really matters
  - more biased trend data often goes in the opposite direction to better quality data
- Early analysis suggest income equality, democracy and market regulation are important
Next steps

• Multilevel modelling of the exposure-outcome dataset

• Case studies of countries
  • What policy mixes are (in)effective at reducing inequalities?
  • Why do different measures of socioeconomic position diverge?

• Quality checks, publish and make dataset available
Thanks to my co-authors:

Wendy Hearty, S. Vittal Katikireddi, David Walsh, Aaron Reeves, Julie Arnot, Alastair Leyland

For more information contact:

Email: gmccartney@nhs.net
Twitter: @gerrmccartney1

Protocol available at PROSPERO:

http://www.crd.york.ac.uk/PROSPERO_REBRANDING/display_record.asp?ID=CRD42016025419